

WHAT IS CLAIMED IS:

1. An antenna apparatus mounted on a vehicle having an internal edge being formed by making a hole in a body made of a metal, comprising:

a planar antenna having a radiating element and a ground plate,

wherein the radiating element is positioned at one side of an imaginary plane inside of the internal edge, and

the ground plate is positioned at another side of the imaginary plane.

2. The Antenna apparatus according to claim 1, wherein:

the body defines a concavity,

the internal edge is formed by making the hole in the bottom of the concavity, and

the radiating element is positioned in the concavity.

3. The antenna apparatus according to claim 1, further comprising:

a metal plate positioned between the radiating element and the ground plate.

4. The antenna apparatus according to claim 3, wherein the body, the metal plate and the ground plate are electrically connected to each other to be at the same electric potential.

5. The antenna apparatus according to claim 4, wherein the body and the metal plate are connected by an electrical connection element such as a metal and a dielectric.

6. The antenna apparatus according to claim 3, wherein the radiating element, the ground plate and the metal plate are molded by a resin.

7. A method for mounting a planar antenna on a vehicle, the planar antenna having a radiating element and a ground plate, the method comprising the steps of:

boring a hole in a body of the vehicle; and

locating the planar antenna in the hole so that an imaginary plane inside of an internal edge is positioned between the radiating element and the ground plate.

8. An antenna apparatus mounted on a metal attachment plate that defines a hole, the attachment plate having an internal edge, the antenna apparatus comprising:

a planar antenna having a radiating element and a ground plate,

wherein the radiating element is positioned on a first side of a plane traversing the hole, and

the ground plate is positioned on a second side of the plane.

9. The antenna apparatus according to claim 8, wherein at a location between the radiating element and the ground plate an imaginary plane traverses the hole.

10. An antenna apparatus mounted on a vehicle, the antenna apparatus comprising:

a planar antenna having a radiating element and a ground plate; and

a metal vehicular body, the body defining a hole which has an internal edge,

wherein a imaginary plane traversing the hole is located between the radiating element and the ground plate.